

ABSTRACT

A power generating system having a hybrid gasification cycle, in which CO₂ is recycled to a gasifier to be used as a gasification reactant and working fluid. The power generating system includes a source of fresh, pure oxygen, a gasifier, a particle separator arranged in flow connection with the gasifier, a syngas combustor, a gas turbine arranged in flow connection with the syngas combustor, a steam generator arranged in flow connection with the outlet of the gas turbine, and a gas compressor system which discharges a stream of compressed exhaust gas. A first portion of the stream of compressed exhaust gas is conducted to the gasifier to control the temperature in the gasifier, to provide CO₂ and steam for gasification, and to decrease the demand for fresh, pure oxygen therein.